Francisco, I may not know about the work," said Robin Palmer, a

senior manager at Peat Marwick. WAIS delivers information over

Internet, a collection of 2,600 high-

speed public and private computer

networks. This government-spon-sored system of data highways is

rapidly being improved and turned

The market for software tha

allows the rapid retrieval of com-

puterized text is small but grow

ing, according to industry analysts. In 1989, the United States had

fewer than 60,000 users. By the

'Information-retrieval technological

gy is starting to spread from su-

percomputers all the way down to

personal computers," said Brew-

The WAIS system is built on

procedure for retrieving informa

field as Z39.50 - now has the

support of the Library of Congress, Apple, Sun Microsytems Inc., Next

Inc., Dow Jones and Mead Data

next year, total sales were about \$120 million. The Delphi Consult

The world at your keyboard

Nationwide network links gobs of information

feedback" program presents other

documents most like the ones se-

getting not too much and not too little." said Father D

Release 1.0, a computer industry

way services operate today, Dyson said. A computer user may need to

call seven or eight data bases de-

pending on the kind of information

The WAIS system lets users of

Apple computers harness a net-work of Thinking Machines super-

ties. Users also can read electronic

wide variety of documents, news-

At Thinking Machines, the WAIS

system serves as a "corporate

memory," allowing employees to retrieve memos, documents and

other internal information. Em-

ployees who may not be working

together can share expertise.

or several, and then a "relevance" Los Angeles and I'm sitting in San sources on the network.

mail, enter their corporate elec- initially set out to computeriz

ogether can share expertise.

ry, or "white pages," will keep an "if someone did something in up-to-date list of all the separate

nents and more. PS/1™

tronic libraries and summon up a their card catalogs.

said Esther Dyson, editor of

typing common

Cover Story

work where information can be Users search by

a Cambridge, Mass., supercomputer manufacturer, has made its English phrases.

Lotus Development Corp., predicts "This solves the problem of how the growth of a new industry as to get to the information you need,

Area Information Servers, or computers and smaller "server"

WAIS. The system permits com- computers to search data bases

puter users to search through a stored by Dow Jones, KPMG and huge volume of information quick-

LIBRARY, from Page 1F

software available free.

copied instantly. But to encourage

progress, Thinking Machines Corp.,

Some industry enthusiasts say

the new technology will transform

the way computerized information

is sold. Mitchell Kapor, founder of

significant as the personal comput-

Some companies, like Dow

Jones Corp. that provide comput-

erized information over telephone

lines have taken part in developing

the new computer library. In 1989, Thinking Machines en-

listed the support of Dow Jones,

Apple Computer Inc. and the KPMG Peat Marwick accounting

and consulting firm to design the

computer library, called Wide

searches by typing common Eng-lish phrases instead of more com-

While current systems like Dia-

log and Nexis require users to

specify precisely the information

respond to a user's inferences. It

initially presents a sample list of

TOSHIBA

Limitless Laptop

IBM Personal Computer or PC

compatible.
The Mac's icons and pull-down menus are easier to remember and use than DOS's typed commands. Even when Windows adds an icon and menu interface to the PC, the Mac's quick and easy way with added peripherals and changed configurations (such as installing and choosing a printer) still put it

But Macs have been seen as having less raw horsepower than the fastest PCs. For that reason among many — not everybody owns a Mac, despite the ease of

But are the fastest PCs really more potent than the fastest Macs? Within that question are several smaller questions. Which PC do you compare with which Mac? Do you compare machines of the same price? Do you run the same programs available for each? And what sort of computer power are you talking about, anyway?

Computer power comes in several forms: processor "integer" speed, processor "floating-point speed, memory size, disk speed, disk size and graphics quality and speed. A computer that is great in one category won't necessarily be tops in another. And it may not

Server computers on networks need all the processing integer speed and memory they can get to manage the work of many dependent network computers. They also need large and fast disks to handle all the saved and retrieved files. But they don't need graphics and rarely need floating-point speed (for handling complex mathemati-cal equations).

Some individual computers need maximum processor integer and floating-point speed to crunch omplex sets of numbers or tangled desk-top publishing pages of text and graphics. But an individual computer probably doesn't need the disk capacity that a server needs. If that individual computer is massaging a data base, though, it may need the large disk but be able to live without the floating-The Macintosh IIfx (Apple Com-

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Artview Notebook Computer

Phillip Robinson

the fastest Mac Apple makes. It is built around a 40MHz 68030 chip,

almost the latest chip in the 68000

processor family. I say "almost"

because there is a 50MHz 68030

chip that you can find on a few

Macintosh "accelerator" boards

(you plug these into a slower Mac

to speed it up). There are even a

few new products with the new

68040 chip, a processor that is two

times faster on integer processing

and five times faster on floating

point processing than the 68030.

(By this fall Apple may have its own 68040 Macintosh.) You can

buy the system with an 80-mega-

byte hard drive or a 160-megabyt

drive - I suggest the latter. The

standard memory of 4 megabytes

is fine for anyone who runs one

ng another 4 megabytes or so.

program at a time, but most peo

ple will be more comfortable add-

The IIfx comes without video

card or monitor - because some

people want a fast Mac for number

crunching with minimum graphics

while others want a Mac for large-

large Mac, with six slots for add-in

cards (though it needs one of those

Systems, \$8,699, (800) 553-0331) is

not the fastest personal computer Zenith makes, but it's close. It is

built around a 25MHz 486 proces-

33MHz version that is about one-

third faster. Some competitors have announced imminent 50MHz

486 machines that would have

This Zenith is compact — it

takes up only half as much desk

space as the Mac IIfx — but has

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sor chip. Zenith now makes a

The Zenith 486/25E (Zenith Data

screen graphics with minimum

number crunching. This is also a

slots for a video board).

Z-486/25E, \$8,699. From Zenith Data Systems Inc., 2150 East Lake Cook Road, Buffalo Grove, IL 60089. (800) 553-0331 or (708) 808-5000. Macintosh IIfx, \$8,669. From Apple Computer Inc., 20525 Mariani Ave., Cupertino, CA 95014. (408) 996-1010.

fastest Macintosh Apple makes. The Zenith 486/25E exemplifies the fastest PC you can buy for the same price from a big-name PC maker. The two machines can be equipped with Identical memory, disk and graphics. When running Windows software, the Zenith feels about the same speed as the Ilfx. However, running DOS software, the Zenith is faster at the same tasks. though harder to learn than the Mac. I don't see a big gap be-tween the fastest PCs and Macs, though Apple will soon need an even faster Mac to compete with the new 50MHz 486 PCs. When you're considering Mac vs. PC yourself, compare them running the software you care about. Don't just compare sterile bench-mark figures of purified perfor-

On a scale of one to four, with one indicating poor and four indicating excellent, here's how the product rates:

Value: 🖳 🖳 🖳

twice the processor speed of the only three open slots for add-in cards. Just as with the Mac IIfx. it The 486/25E comes with a 170comes without a video card or a megabyte hard drive and 4 megamonitor — you buy those separate bytes of memory, almost identical ly. If you want to add other periph erals to it, there's a standard SCSI to the IIfx. I'd raise that 4 megabytes to 8, especially if you use port on the back, just as you'll find

on the Mac IIfx. So which one is more powerful? They have the same amount of memory, though the Mac can al-

some recent Computing product reviews. Each product is rated on a scale of one to four, with one computer indicating poor and four indicating excellent:

the Zenith can only use 640 kilo-

bytes at a time unless you're run-

same amount of disk capacity and speed. The graphics could be near-ly identical because you choose

which video card and monitor to

And therefore, the decision

comes down to floating-point and

integer performance, right? Well,

sort of, but not really. The problem

is that few people just run calcula-tions on their computers. They run programs. What matters is how

fast the computers are at running

the same application program or

at least the same kind of applica-

tion. Does PageMaker on the Mac run faster than PageMaker on the

PC? Does Harvard Graphics on the

One columnist suggests that on

this "applications" basis, a IIfx holds the same power as a 25MHz 386 PC. That would make the

25MHz 486 PC about twice as fast.

Apple publishes a study that says

machine. Clearly, it depends on who is running the test and just

what is measured. Generally I'd

say the IIfx is about the same speed as the 25MHz 486 machine

But you don't have to use Win-

dows. You could run standard PC

programs, without Windows, and

then you'd be running faster than

the Mac. It might not be as "easy"

as a Mac, but it would be faster.

much if you're comparing Windows to standard Mac software.

My conclusions? The power dif-

ference between Mac and PC isn't

However, if you run DOS software

on the PC, you can run faster than a Mac. And if you elude the major PC brands and buy from a discount

house, you can get the PC power

for less money. And Apple had bet-

ter have some new machines read

486 boxes will push PC power be-yond the realm that even an accel-

Phillip Robinson is an author o

books and articles about computers and an editor for Virtual Informa-tion of Sausalito. If you have a

comment or want to suggest hard

ware or software you'd like to see

reviewed, write him care of the San

erated Mac can reach.

soon because the advent of 50MHz

running Windows software.

the IIfx is faster than a 33MHz 486

PC run faster than MacDraw Pro

ning Windows. They have about the

WordPerfect 2.0, for Apple Macintosh Plus or better with hard disk drive. \$495. From WordPerfect Corp., 1555 North Technology Way, Orem, UT 84057. (800)

WordPerfect 2.0 for the Macintosh is a big improvement over Version 1.0 and a real challenger to Word and MacWrite. It still isn't as easy to use as I'd like, but it comes closer in its organization of commands and options. Although it lacks some features such as direct import and export of Word files and an integrated outliner, it has an extensive list of abilities from text styles such as strikeout and redline to powerful macros, spelling checker and thesaurus, indexing and keyboard configuring, kerning and columns for desk-top publishing, and even a complete graphics program built in. (Reviewed 7/14/91)

MS-DOS 5, for PC or compatible with at least 512K RAM, 2.8MB sion of DOS. \$99.95 as upgrade from previous MS-DOS version. From Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399. (206) 882-8080.

patible with at least 256K RAM and 1.2MB of free hard disk space. \$79 as upgrade from previous DR DOS or MS-DOS version, \$199.95 as first-time buy. \$19.95 option for Magellan. From Digital Research, Box DRI, 70 Garden Court, Monterey, CA 93942. (408)

years, smaller and more frugal equipped with a fine text editor, a decent task-switcher, more command options and an undelete function to recover lost files. However, DR DOS 5.0 with the Magel-lan utility option has all of that (except the task switcher) and more. Both are good programs, and everyone with a PC should upgrade to one or the other. I prefer DR DOS. (Reviewed 7/7/91)

Blaupunkt Travelpilot \$4,200. From Blaupunkt Bosc Sales Group Mobile Commu tions Division, 2800 South 25th

you where you are. Using wheel sensors, it can detect your car's direction and speed - matching that to the grid of streets stored on a CD-ROM disk, it displays your current position on a 41/2-inch screen in the car and lets you locate any other place on the screen's map. It works well and easily but is too expensive for in dividuals. It may be practical already for delivery, sales, public safety, field service and other orcounts and can team the Travelpi

SuperStor, for IBM PC or compatible with at least 640 kilobytes of random-access memor and DOS 3.2 or later, \$129. From AddStor Inc., 3905 Bohanno Drive, Menlo Park, CA 94025

"On-the-fly" compression prothey'll occupy less disk space and can be more quickly stored and retrieved. SuperStor is a good ex-

Here are summaries of

Blaupunkt's Travelpilot is a specialized car computer that tells

SuperDisk!, for Apple Macintosh Plus or later with System 6.0 or System 7.0. \$89. From Alysis Software Corp., 1231 31st Ave.

though it requires you to explicit any Macintosh can receive and unsqueeze even without its own

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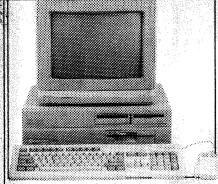
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Odette Kummer, Kummer & Associates

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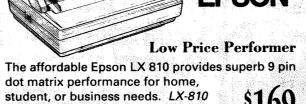
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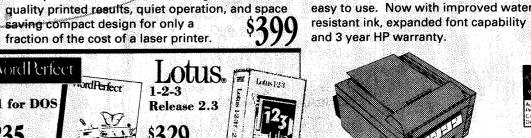
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levels, it may do so with a ven-

surge or spike that can damage or

While the sudden loss of power

in a blackout won't necessarily

hurt the computer's circuitry,

can ruin your day if your compute

was writing data to the disk drive.

Your data files may be corrupted

or your entire hard disk may be trashed. So back up your important

If you're using your PC when the

power goes out, turn everything off immediately and wait for the pow-

er to be restored before you turn

213MB IDE, 64K CACHE/15MS.

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PRODUCT OF THE MONTH

estroy delicate components.

By Michael J. Himowitz Baltimore Evening Sun

If you take your computer on the road where summers are prone to humidity and lightning strikes, make sure you've protected it against electronic hazards. Just plain heat can wreak havoc

on your computer, too. But with the right precautions - some of which are simple and some of which aren't — you can minimize climates is that the weather can

interfere with your computer's lifeblood — a steady supply of clean electric current Computers are delicate instruments. The chips inside them are very sensitive to static electricity,

and the circuitry itself is designed When you plug in your computer and turn it on, a transformer inside the computer, known as the power upply, takes the 117-volt alternating current from your wall outlet

and turns it into the more gentle 5-

By L.R. Shannon New York Times

"DOS Batch File Power With the

\$39.95) is a book-disk combination

rom prolific author Kris Jamsa on

one of the operating system's most useful dodges. A batch file is a

program made up of DOS com-

uted one after another, rather

an having to be typed one by one.

For an elementary example, DIR is the command that gives

directory of what is on a

But if the list is longer than

screen, the top will scroll into

imsa Batch Utilities" (Sams,

Reading List

Help in harnessing DOS

blivion before you get to read it. the basics. The special binding lays

To solve that you might type flat wherever it is opened without DIR/W, which gives a multicollossening the pages.

While most power supplies can handle normal fluctuations in wall current, summertime produces some abnormal conditions. The biggest abnormal condition of them all is lightning — the Attila the Hun of static electricity discharges.

current, summertime produces some abnormal conditions. The biggest abnormal condition of them all is lightning — the Atti-la the Hun of static electricity dis-

Many people believe the surge suppressors available in hardware stores and computer outlets will protect PCs from lightning strikes. They won't. Nothing that relies on one electrical contact sitting a few millimeters away from another can keep lightning from bridging

The only sure way to keep a lightning strike from frying your computer is to pull the plug. cuitry, and your computer may you'll avoid damage from high stop working altogether. Likewise, voltage spikes that can accompany computer is to pull the plug. hazard, brownouts and sudden

umn listing, which might be contained on one screen. But it gives

For full information, you could

use DIR/P, which pauses at the end of each screenful until you hit

a key. I wrote three simple batch files for each style of directory. All

I have to type is D, DW or DP.

Here are more than 600 pages of inside information on batch files

and three disks of utilities for the

written "Simply DOS" (Osborne

McGraw-Hill, \$14.95), a clear,

beautifully illustrated treatment of

batch file lover in you.

handle normal fluctuations in wall blackouts aren't. You never know when they're going to happen. mand for power is at its peak, electric companies may reduce

voltage to a point at which your

computer's circuitry can no longer compensate. This is known as a

A lightning strike miles from your home or office can cut power to your neighborhood completely. This is known as a blackout. Brownouts and blackouts pose a

variety of problems for computer users. When the voltage gets too low, it can damage your PC's cir- on the computer again. That way

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circuits, can protect your computer against this kind of voltage flucone, because you may not be around when the power goes out. If you absolutely have to keep your PC running, or you want protection against hard disk crashes caused by sudden power loss, you may want to invest in an uninter-

ruptible power supply, or UPS.

A UPS is basically a box containing a rechargeable battery and other circuitry that sits between your wall outlet and the computer. Most UPS boxes contain filters, a voltage regulator, surge and spike suppressors that can deal PC as a file server, the file server with any power fluctuation short of should be on a UPS even if the a lightning strike. But their main other computers aren't.

Good surge suppressors, which advantage is that they sense a sudare primarily designed to deal den drop in current in a few microwith the everyday surges and seconds and automatically switch spikes in office building electric your PC to battery power.

A UPS isn't cheap, but it's a lot cheaper than losing the records of tuation. So it's a good idea to buy your accounts payable through a disk crash caused by a blackout. UPS start at about \$300 and head toward the stratosphere means you can plug more than one computer or peripheral into it, or

> At the very least, a UPS will give you the opportunity to shut down your system in an orderly fashion. If your office has a com

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Power is the next problem. These technologies come with an electrical cord. To ensure there are enough plugs and power avail-able to prevent overloaded cir-COMPUTER cuits, classrooms will need to be reconfigured. The cords themelves are a safety issue and dictate the way a classroom can be configured. Teachers and students must match the space with the vailability of power sources. and power problems, they must make sure their classrooms are COMPUTERS AT LARGE

flexible. Small group learning — in which students help each other understand the technology - has become a more effective mode of learning. Where do these small groups meet? They need room to isolate noise from computers, printers and audio equipment. Also, large groups need to be able to see and hear the teacher. Younger students still need floor space for math activities, story time, art projects and old-fashioned paper and pencil activities.

nance is vital to the computers' daily functioning and life expectancy. Humidity and temperature must be regulated to make sure the machines function properly. To prevent an electric short-circuit and loss of data, the environment must be dust-free.

orinters, CD-ROMS, laser video lisks, scanners and a teacher who is dedicated and educated to make use of computer's potential, schools still face major hurdles. go a long way toward creating so-

Computers in Education

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Class redesign needed for '90s

HERE ARE hundreds. maybe even thousands, of computers in schools that are not being used. Probably even in your child's school. It's not the price of the computers and technology that is keeping students from the keyboard Effective teacher education is a barrier — but not the only one. Re-

search released within the last

year revealed other problems. If we are to see the media-rich classrooms that we envision, there are 10 other issues we must wrestle with. These issues were brought into focus by a research paper that will be presented this week. The paper is being researched by the **Apple Classrooms of Tomorrow** Project in conjunction with Architecture and Building Science, a re-search group within the School of Architecture at the New Jersey Institute of Technology.

Here are the issues: ✓ More space is required for

technology.

The mode of teaching can alter the design requirements of the ✓ One student/one desk is now

a hixury. Comfort issues. ✓ The placement of technology is dependent upon the availability of electric service.

✓ Flexibility ✓ The need for natural and artiquired in technology-rich class-

Visibility with the computer and furniture comfort.

If teachers can solve the space and power problems needed for technology, they must make sure their classrooms are flexible.

The aesthetic dilemma Snace has to be considered first.

design, desk and counter space

must be used to house computers;

peripherals such as printers, scan-

ners, CD-ROMs, laser video disk

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This "stacking" blocks students

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one student/one desk argument. If we are going to introduce technology into the classroom with 3M 3 1/2" DS/DD Diskette little or no change to the existing size of the classroom and amount Bush CT122 Desk/Hutch Fax Paper Universal 6 Pack of furniture, the student-desk relationship must be considered. In a traditional classroom, all students work at and store their personal items at their desk. But with comouters and other technologies takng over desk space, the single desk becomes a luxury. For students to continue to feel that they have

their "space," classrooms need to have another storage location.

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